

1	/* =====
2	= * JFreeChart : a free chart library for the Java(tm) platform
3	* =====
4	= *
5	* (C) Copyright 2000-2013, by Object Refinery Limited and Contributors.
6	*
7	* Project Info: <a href="http://www.jfree.org/jfreechart/index.html">http://www.jfree.org/jfreechart/index.html</a>
8	*
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26	*
27	* -----
28	* DataUtilities.java
29	* -----
30	* (C) Copyright 2003-2013, by Object Refinery Limited and contributors.
31	*
32	* Original Author: David Gilbert (for Object Refinery Limited);
33	* Contributor(s): Peter Kolb (patch 2511330);
34	*
35	* Changes
36	* -----
37	* 05-Mar-2003 : Version 1 (DG);
38	* 03-Mar-2005 : Moved createNumberArray() and createNumberArray2D() methods
39	*       from the DatasetUtilities class (DG);
40	* 17-May-2005 : Added calculateColumnTotal() and calculateRowTotal()
41	*       methods (DG);
42	* 28-Jan-2009 : Added equal(double[][], double[][]) method (DG);
43	* 28-Jan-2009 : Added clone(double[][]) method (DG);
44	* 04-Feb-2009 : Added calculateColumnTotal/RowTotal variants (PK);
45	* 03-Jul-2013 : Use ParamChecks (DG);
46	*
47	*/
48	
49	package org.jfree.data;
50	
51	import java.util.Arrays;
52	import org.jfree.chart.util.ParamChecks;
53	import org.jfree.data.general.DatasetUtilities;

54		
55		/**
56		* Utility methods for use with some of the data classes (but not the datasets,
57		* see {@link DatasetUtilities}).
58		*/
59		public abstract class DataUtilities {
60		
61		/**
62		* Tests two arrays for equality. To be considered equal, the arrays must
63		* have exactly the same dimensions, and the values in each array must also
64		* match (two values that are both NaN or both INF are considered equal
65		* in this test).
66		*
67		* @param a the first array (<code>>null</code> permitted).
68		* @param b the second array (<code>>null</code> permitted).
69		*
70		* @return A boolean.
71		*
72		* @since 1.0.13
73		*/
74		public static boolean equal(double[][] a, double[][] b) {
75	<u>4</u>	if (a == null) {
76	<u>1</u> <u>2</u>	return (b == null);
77		}
78	<u>4</u>	if (b == null) {
79	<u>7</u>	return false; // already know 'a' isn't null
80		}

81	<u>8</u>	if (a.length != b.length) {
82	<u>7</u>	return false;
83		}
84	<u>1</u> <u>2</u>	for (int i = 0; i < a.length; i++) {
85	<u>1</u> <u>2</u>	if (!Arrays.equals(a[i], b[i])) {
86	<u>7</u>	return false;
87		}
88		}
89	<u>8</u>	return true;
90		}
91		
92		/**
93		* Returns a clone of the specified array.
94		*
95		* @param source the source array (<code>null</code> not permitted).
96		*
97		* @return A clone of the array.
98		*
99		* @since 1.0.13
100		*/
101		public static double[][] clone(double[][] source) {
102	<u>1</u>	ParamChecks.nullNotPermitted(source, "source");
103		double[][] clone = new double[source.length][];
104	<u>1</u> <u>2</u>	for (int i = 0; i < source.length; i++) {

10 5	<u>2</u>	if (source[i] != null) {
10 6	<u>5</u>	double[] row = new double[source[i].length];
10 7	<u>2</u> <u>1</u>	System.arraycopy(source[i], 0, row, 0, source[i].length);
10 8	<u>5</u>	clone[i] = row;
10 9		}
11 0		}
11 1	<u>2</u>	return clone;
11 2		}
11 3		
11 4		/**
11 5		* Returns the total of the values in one column of the supplied data
11 6		* table.
11 7		*
11 8		* @param data the table of values (<code>>null</code> not permitted).
11 9		* @param column the column index (zero-based).
12 0		*
12 1		* @return The total of the values in the specified column.
12 2		*/

12 3		public static double calculateColumnTotal(Values2D data, int column) {
12 4	<u>1</u>	ParamChecks.nullNotPermitted(data, "data");
12 5	<u>5</u>	double total = 0.0;
12 6	<u>1</u>	int rowCount = data.getRowCount();
12 7	<u>2</u> <u>5</u>	for (int r = 0; r < rowCount; r++) {
12 8	<u>1</u> <u>1</u>	Number n = data.getValue(r, column);
12 9	<u>4</u>	if (n != null) {
13 0	<u>1</u> <u>3</u>	total += n.doubleValue();
13 1		}
13 2		}
13 3	<u>7</u>	return total;
13 4		}
13 5		
13 6		/**
13 7		* Returns the total of the values in one column of the supplied data
13 8		* table by taking only the row numbers in the array into account.
13 9		*
14 0		* @param data the table of values (<code>>null</code> not permitted).

14 1		* @param column the column index (zero-based).
14 2		* @param validRows the array with valid rows (zero-based).
14 3		*
14 4		* @return The total of the valid values in the specified column.
14 5		*
14 6		* @since 1.0.13
14 7		*/
14 8		public static double calculateColumnTotal(Values2D data, int column,
14 9		int[] validRows) {
15 0	<u>1</u>	ParamChecks.nullNotPermitted(data, "data");
15 1	<u>5</u>	double total = 0.0;
15 2	<u>1</u>	int rowCount = data.getRowCount();
15 3	<u>2</u> <u>0</u>	for (int v = 0; v < validRows.length; v++) {
15 4	<u>1</u> <u>0</u>	int row = validRows[v];
15 5	<u>1</u> <u>9</u>	if (row < rowCount) {
15 6	<u>1</u> <u>1</u>	Number n = data.getValue(row, column);
15 7	<u>4</u>	if (n != null) {
15 8	<u>1</u> <u>3</u>	total += n.doubleValue();

15 9		}
16 0		}
16 1		}
16 2	<u>7</u>	return total;
16 3		}
16 4		
16 5		/**
16 6		* Returns the total of the values in one row of the supplied data
16 7		* table.
16 8		*
16 9		* @param data the table of values (<code>null</code> not permitted).
17 0		* @param row the row index (zero-based).
17 1		*
17 2		* @return The total of the values in the specified row.
17 3		*/
17 4		public static double calculateRowTotal(Values2D data, int row) {
17 5	<u>1</u>	ParamChecks.nullNotPermitted(data, "data");
17 6	<u>5</u>	double total = 0.0;



17 7	<u>1</u>	int columnCount = data.getColumnCount();
17 8	<u>2</u> <u>5</u>	for (int c = 0; c < columnCount; c++) {
17 9	<u>1</u> <u>1</u>	Number n = data.getValue(row, c);
18 0	<u>4</u>	if (n != null) {
18 1	<u>1</u> <u>3</u>	total += n.doubleValue();
18 2		}
18 3		}
18 4	<u>7</u>	return total;
18 5		}
18 6		
18 7		/**
18 8		* Returns the total of the values in one row of the supplied data
18 9		* table by taking only the column numbers in the array into account.
19 0		*
19 1		* @param data the table of values (<code>null</code> not permitted).
19 2		* @param row the row index (zero-based).
19 3		* @param validCols the array with valid cols (zero-based).
19 4		*

19 5		* @return The total of the valid values in the specified row.
19 6		*
19 7		* @since 1.0.13
19 8		*/
19 9		public static double calculateRowTotal(Values2D data, int row,
20 0		int[] validCols) {
20 1	<u>1</u>	ParamChecks.nullNotPermitted(data, "data");
20 2	<u>5</u>	double total = 0.0;
20 3	<u>1</u>	int colCount = data.getColumnCount();
20 4	<u>2</u> <u>0</u>	for (int v = 0; v < validCols.length; v++) {
20 5	<u>1</u> <u>0</u>	int col = validCols[v];
20 6	<u>1</u> <u>9</u>	if (col < colCount) {
20 7	<u>1</u> <u>1</u>	Number n = data.getValue(row, col);
20 8	<u>4</u>	if (n != null) {
20 9	<u>1</u> <u>3</u>	total += n.doubleValue();
21 0		}
21 1		}
21 2		}

21 3	<u>7</u>	return total;
21 4		}
21 5		
21 6		/**
21 7		* Constructs an array of <code>Number</code> objects from an array of
21 8		* <code>double</code> primitives.
21 9		*
22 0		* @param data the data ( <code>null</code> not permitted).
22 1		*
22 2		* @return An array of <code>Double</code> .
22 3		*/
22 4		public static Number[] createNumberArray(double[] data) {
22 5	<u>1</u>	ParamChecks.nullNotPermitted(data, "data");
22 6		Number[] result = new Number[data.length];
22 7	<u>1</u> <u>9</u>	for (int i = 0; i < data.length; i++) {
22 8	<u>1</u> <u>6</u>	result[i] = new Double(data[i]);
22 9		}
23 0	<u>2</u>	return result;

23 1		}
23 2		
23 3		/**
23 4		* Constructs an array of arrays of <code>Number</code> objects from a
23 5		* corresponding structure containing <code>double</code> primitives.
23 6		*
23 7		* @param data the data ( <code>null</code> not permitted).
23 8		*
23 9		* @return An array of <code>Double</code> .
24 0		*/
24 1		public static Number[][] createNumberArray2D(double[][] data) {
24 2	<u>1</u>	ParamChecks.nullNotPermitted(data, "data");
24 3		int l1 = data.length;
24 4	<u>5</u>	Number[][] result = new Number[l1][];
24 5	<u>2</u> <u>5</u>	for (int i = 0; i < l1; i++) {
24 6	<u>1</u> <u>1</u>	result[i] = createNumberArray(data[i]);
24 7		}
24 8	<u>2</u>	return result;

24 9		}
25 0		
25 1		/**
25 2		* Returns a {@link KeyedValues} instance that contains the cumulative
25 3		* percentage values for the data in another {@link KeyedValues} instance.
25 4		* <p>
25 5		* The percentages are values between 0.0 and 1.0 (where 1.0 = 100%).
25 6		*
25 7		* @param data the data (<code>>null</code> not permitted).
25 8		*
25 9		* @return The cumulative percentages.
26 0		*/
26 1		public static KeyedValues getCumulativePercentages(KeyedValues data) {
26 2	<a href="#">1</a>	ParamChecks.nullNotPermitted(data, "data");
26 3	<a href="#">1</a>	DefaultKeyedValues result = new DefaultKeyedValues();
26 4	<a href="#">5</a>	double total = 0.0;
26 5	<a href="#">20</a>	for (int i = 0; i < data.getItemCount(); i++) {
26 6	<a href="#">6</a>	Number v = data.getValue(i);

26 7	<u>4</u>	if (v != null) {
26 8	<u>1</u> <u>3</u>	total = total + v.doubleValue();
26 9		}
27 0		}
27 1	<u>5</u>	double runningTotal = 0.0;
27 2	<u>2</u> <u>0</u>	for (int i = 0; i < data.getItemCount(); i++) {
27 3	<u>6</u>	Number v = data.getValue(i);
27 4	<u>4</u>	if (v != null) {
27 5	<u>1</u> <u>3</u>	runningTotal = runningTotal + v.doubleValue();
27 6		}
27 7	<u>2</u> <u>5</u>	result.addValue(data.getKey(i), new Double(runningTotal / total));
27 8		}
27 9	<u>2</u>	return result;
28 0		}
28 1		
28 2		}

## Mutations

75

1. negated conditional → KILLED
2. removed conditional - replaced equality check with false → KILLED
3. removed conditional - replaced equality check with true → KILLED

4. not equal to equal → KILLED

1. replaced boolean return with false for org/jfree/data/DataUtilities::equal → KILLED

2. replaced boolean return with true for org/jfree/data/DataUtilities::equal → NO\_COVERAGE

3. Substituted 1 with 0 → KILLED

4. Substituted 0 with 1 → NO\_COVERAGE

5. negated conditional → KILLED

6. removed conditional - replaced equality check with false → KILLED

7. removed conditional - replaced equality check with true → SURVIVED

8. replaced return of integer sized value with (x == 0 ? 1 : 0) → KILLED

9. replaced return of integer sized value with (x == 0 ? 1 : 0) → NO\_COVERAGE

10. Substituted 0 with 1 → NO\_COVERAGE

11. Substituted 1 with 0 → KILLED

12. Substituted 1 with -1 → SURVIVED

13. Substituted 0 with -1 → NO\_COVERAGE

14. Substituted 1 with -1 → SURVIVED

15. Substituted 1 with 2 → KILLED

16. Substituted 0 with 1 → NO\_COVERAGE

17. Substituted 1 with 0 → KILLED

18. Substituted 0 with -1 → NO\_COVERAGE

19. not equal to equal → KILLED

1. negated conditional → KILLED

2. removed conditional - replaced equality check with false → KILLED

3. removed conditional - replaced equality check with true → KILLED

4. not equal to equal → KILLED

1. replaced boolean return with true for org/jfree/data/DataUtilities::equal → KILLED

2. Substituted 0 with 1 → KILLED

3. replaced return of integer sized value with (x == 0 ? 1 : 0) → KILLED

4. Substituted 0 with 1 → KILLED

5. Substituted 0 with -1 → KILLED

6. Substituted 0 with 1 → KILLED

7. Substituted 0 with -1 → KILLED

1. negated conditional → KILLED

2. removed conditional - replaced equality check with false → SURVIVED

3. removed conditional - replaced equality check with true → KILLED

4. equal to less than → KILLED

5. equal to less or equal → SURVIVED

6. equal to greater than → KILLED

7. equal to greater or equal → SURVIVED

8. equal to not equal → KILLED

1. replaced boolean return with true for org/jfree/data/DataUtilities::equal → NO\_COVERAGE

2. Substituted 0 with 1 → NO\_COVERAGE  
 3. replaced return of integer sized value with (x == 0 ? 1 : 0) → NO\_COVERAGE  
 4. Substituted 0 with 1 → NO\_COVERAGE  
 5. Substituted 0 with -1 → NO\_COVERAGE  
 6. Substituted 0 with 1 → NO\_COVERAGE  
 7. Substituted 0 with -1 → NO\_COVERAGE

1. changed conditional boundary → KILLED  
 2. Substituted 0 with 1 → KILLED  
 3. negated conditional → KILLED  
 4. removed conditional - replaced comparison check with false → KILLED  
 5. removed conditional - replaced comparison check with true → KILLED  
 6. Negated integer local variable number 2 → KILLED  
 7. Substituted 0 with 1 → KILLED  
 8. Substituted 0 with -1 → KILLED  
 9. Substituted 0 with 1 → KILLED  
 10. Substituted 0 with -1 → KILLED  
 11. Less than to less or equal → KILLED  
 12. Less than to greater than → KILLED  
 13. Less than to greater or equal → KILLED  
 14. Less than to equal → KILLED  
 15. Less than to not equal → SURVIVED  
 16. Incremented (a++) integer local variable number 2 → KILLED  
 17. Decrementd (a--) integer local variable number 2 → KILLED  
 18. Incremented (++a) integer local variable number 2 → KILLED  
 19. Decrementd (--a) integer local variable number 2 → KILLED

1. negated conditional → KILLED  
 2. removed call to java/util/Arrays::equals → KILLED  
 3. removed conditional - replaced equality check with false → KILLED  
 4. removed conditional - replaced equality check with true → KILLED  
 5. Negated integer local variable number 2 → KILLED  
 6. Negated integer local variable number 2 → KILLED  
 7. not equal to less than → KILLED  
 8. not equal to less or equal → KILLED  
 9. not equal to greater than → SURVIVED

10. not equal to greater or equal → KILLED  
 11. not equal to equal → KILLED  
 12. Incremented (a++) integer local variable number 2 → KILLED  
 13. Incremented (a++) integer local variable number 2 → SURVIVED  
 14. Decrementd (a--) integer local variable number 2 → KILLED  
 15. Decrementd (a--) integer local variable number 2 → TIMED\_OUT  
 16. Incremented (++a) integer local variable number 2 → KILLED  
 17. Incremented (++a) integer local variable number 2 → KILLED  
 18. Decrementd (--a) integer local variable number 2 → KILLED  
 19. Decrementd (--a) integer local variable number 2 → KILLED

84

85



86

1. replaced boolean return with true for org/jfree/data/DataUtilities::equal → KILLED
2. Substituted 0 with 1 → KILLED
3. replaced return of integer sized value with (x == 0 ? 1 : 0) → KILLED
4. Substituted 0 with 1 → KILLED
5. Substituted 0 with -1 → KILLED
6. Substituted 0 with 1 → KILLED
7. Substituted 0 with -1 → KILLED

89

1. replaced boolean return with false for org/jfree/data/DataUtilities::equal → KILLED
2. Substituted 1 with 0 → KILLED
3. replaced return of integer sized value with (x == 0 ? 1 : 0) → KILLED
4. Substituted 1 with 0 → KILLED
5. Substituted 1 with -1 → SURVIVED
6. Substituted 1 with -1 → SURVIVED
7. Substituted 1 with 2 → KILLED
8. Substituted 1 with 0 → KILLED

10  
2

1. removed call to org/jfree/chart/util/ParamChecks::nullNotPermitted → SURVIVED

10  
4

1. changed conditional boundary → KILLED
2. Substituted 0 with 1 → KILLED
3. negated conditional → KILLED
4. removed conditional - replaced comparison check with false → KILLED
5. removed conditional - replaced comparison check with true → KILLED
6. Negated integer local variable number 2 → KILLED
7. Substituted 0 with 1 → KILLED
8. Substituted 0 with -1 → KILLED
9. Substituted 0 with 1 → KILLED
10. Substituted 0 with -1 → KILLED
11. Less than to less or equal → KILLED
12. Less than to greater than → KILLED
13. Less than to greater or equal → KILLED
14. Less than to equal → KILLED
15. Less than to not equal → SURVIVED
16. Incremented (a++) integer local variable number 2 → KILLED
17. Decrementd (a--) integer local variable number 2 → KILLED
18. Incremented (++a) integer local variable number 2 → KILLED
19. Decrementd (--a) integer local variable number 2 → KILLED

10  
5

1. negated conditional → KILLED
2. removed conditional - replaced equality check with false → KILLED
3. removed conditional - replaced equality check with true → SURVIVED
4. Negated integer local variable number 2 → KILLED
5. equal to not equal → KILLED
6. Incremented (a++) integer local variable number 2 → KILLED
7. Decrementd (a--) integer local variable number 2 → KILLED
8. Incremented (++a) integer local variable number 2 → KILLED

9. Decrementd (--a) integer local variable number 2 → KILLED

1. Negated integer local variable number 2 → KILLED
2. Incremented (a++) integer local variable number 2 → KILLED
3. Decrementd (a--) integer local variable number 2 → KILLED
4. Incremented (++a) integer local variable number 2 → KILLED
5. Decrementd (--a) integer local variable number 2 → KILLED

1. Substituted 0 with 1 → KILLED
2. Substituted 0 with 1 → KILLED
3. removed call to java/lang/System::arraycopy → SURVIVED

4. Negated integer local variable number 2 → KILLED
5. Negated integer local variable number 2 → KILLED
6. Substituted 0 with 1 → KILLED
7. Substituted 0 with 1 → KILLED
8. Substituted 0 with -1 → KILLED
9. Substituted 0 with -1 → KILLED
10. Substituted 0 with 1 → KILLED
11. Substituted 0 with 1 → KILLED
12. Substituted 0 with -1 → KILLED
13. Substituted 0 with -1 → KILLED
14. Incremented (a++) integer local variable number 2 → KILLED
15. Incremented (a++) integer local variable number 2 → KILLED
16. Decrementd (a--) integer local variable number 2 → KILLED
17. Decrementd (a--) integer local variable number 2 → KILLED
18. Incremented (++a) integer local variable number 2 → KILLED
19. Incremented (++a) integer local variable number 2 → KILLED
20. Decrementd (--a) integer local variable number 2 → KILLED
21. Decrementd (--a) integer local variable number 2 → KILLED

1. Negated integer local variable number 2 → KILLED
2. Incremented (a++) integer local variable number 2 → KILLED
3. Decrementd (a--) integer local variable number 2 → TIMED\_OUT
4. Incremented (++a) integer local variable number 2 → KILLED
5. Decrementd (--a) integer local variable number 2 → KILLED

1. replaced return value with null for org/jfree/data/DataUtilities::clone → KILLED
2. mutated return of Object value for org/jfree/data/DataUtilities::clone to ( if (x != null) null else throw new RuntimeException ) → KILLED

1. removed call to org/jfree/chart/util/ParamChecks::nullNotPermitted → SURVIVED

1. Substituted 0.0 with 1.0 → KILLED
2. Substituted 0.0 with 1.0 → KILLED
3. Substituted 0.0 with -1.0 → KILLED
4. Substituted 0.0 with 1.0 → KILLED
5. Substituted 0.0 with -1.0 → KILLED

12  
6

1. removed call to org/jfree/data/Values2D::getRowCount → KILLED

1. changed conditional boundary → KILLED
2. Changed increment from 1 to -1 → KILLED
3. Substituted 0 with 1 → KILLED
4. negated conditional → KILLED
5. removed conditional - replaced comparison check with false → KILLED
6. removed conditional - replaced comparison check with true → KILLED
7. Negated integer local variable number 5 → KILLED
8. Negated integer local variable number 4 → KILLED
9. Substituted 0 with 1 → KILLED
10. Substituted 0 with -1 → KILLED
11. Substituted 0 with 1 → KILLED
12. Substituted 0 with -1 → KILLED
13. Less than to less or equal → KILLED
14. Less than to greater than → KILLED
15. Less than to greater or equal → KILLED
16. Less than to equal → KILLED
17. Less than to not equal → SURVIVED

18. Incremented (a++) integer local variable number 5 → KILLED
19. Incremented (a++) integer local variable number 4 → KILLED
20. Decrementd (a--) integer local variable number 5 → KILLED
21. Decrementd (a--) integer local variable number 4 → KILLED
22. Incremented (++a) integer local variable number 5 → KILLED
23. Incremented (++a) integer local variable number 4 → KILLED
24. Decrementd (--a) integer local variable number 5 → KILLED
25. Decrementd (--a) integer local variable number 4 → KILLED

1. removed call to org/jfree/data/Values2D::getValue → KILLED
2. Negated integer local variable number 5 → KILLED
3. Negated integer local variable number 1 → SURVIVED

4. Incremented (a++) integer local variable number 5 → KILLED
5. Incremented (a++) integer local variable number 1 → KILLED
6. Decrementd (a--) integer local variable number 5 → KILLED
7. Decrementd (a--) integer local variable number 1 → KILLED
8. Incremented (++a) integer local variable number 5 → KILLED
9. Incremented (++a) integer local variable number 1 → KILLED
10. Decrementd (--a) integer local variable number 5 → KILLED
11. Decrementd (--a) integer local variable number 1 → KILLED

12  
8

1. negated conditional → KILLED
2. removed conditional - replaced equality check with false → KILLED
3. removed conditional - replaced equality check with true → SURVIVED
4. equal to not equal → KILLED

12  
9

1. Replaced double addition with subtraction → KILLED
2. removed call to java/lang/Number::doubleValue → KILLED
3. Negated double local variable number 2 → KILLED
4. Replaced double operation with first member → KILLED

13  
0

5. Replaced double operation by second member → KILLED
6. Replaced double addition with subtraction → KILLED
7. Replaced double addition with multiplication → KILLED
8. Replaced double addition with division → KILLED
9. Replaced double addition with modulus → KILLED
10. Incremented (a++) double local variable number 2 → SURVIVED
11. Decrementd (a--) double local variable number 2 → SURVIVED
12. Incremented (++a) double local variable number 2 → KILLED
13. Decrementd (--a) double local variable number 2 → KILLED

1. replaced double return with 0.0d for  
org/jfree/data/DataUtilities::calculateColumnTotal → KILLED
2. replaced return of double value with -(x + 1) for  
org/jfree/data/DataUtilities::calculateColumnTotal → KILLED
3. Negated double local variable number 2 → KILLED
4. Incremented (a++) double local variable number 2 → SURVIVED
5. Decrementd (a--) double local variable number 2 → SURVIVED
6. Incremented (++a) double local variable number 2 → KILLED
7. Decrementd (--a) double local variable number 2 → KILLED

1. removed call to org/jfree/chart/util/ParamChecks::nullNotPermitted → SURVIVED

1. Substituted 0.0 with 1.0 → KILLED
2. Substituted 0.0 with 1.0 → KILLED
3. Substituted 0.0 with -1.0 → KILLED
4. Substituted 0.0 with 1.0 → KILLED
5. Substituted 0.0 with -1.0 → KILLED

1. removed call to org/jfree/data/Values2D::getRowCount → KILLED

1. changed conditional boundary → KILLED
2. Changed increment from 1 to -1 → KILLED
3. Substituted 0 with 1 → KILLED
4. negated conditional → KILLED
5. removed conditional - replaced comparison check with false → KILLED
6. removed conditional - replaced comparison check with true → KILLED
7. Negated integer local variable number 6 → KILLED
8. Substituted 0 with 1 → KILLED
9. Substituted 0 with -1 → KILLED
10. Substituted 0 with 1 → KILLED
11. Substituted 0 with -1 → KILLED
12. Less than to less or equal → KILLED
13. Less than to greater than → KILLED
14. Less than to greater or equal → KILLED
15. Less than to equal → KILLED
16. Less than to not equal → SURVIVED
17. Incremented (a++) integer local variable number 6 → KILLED
18. Decrementd (a--) integer local variable number 6 → KILLED

19. Incremented (++a) integer local variable number 6 → KILLED  
20. Decrementd (--a) integer local variable number 6 → KILLED

1. Negated integer local variable number 6 → KILLED  
2. Negated integer array field → KILLED  
3. Incremented (a++) integer local variable number 6 → KILLED  
4. Incremented (a++) integer array field → SURVIVED  
5. Decrementd (a--) integer local variable number 6 → TIMED\_OUT  
6. Decrementd (a--) integer array field → SURVIVED  
7. Incremented (++a) integer local variable number 6 → KILLED  
8. Incremented (++a) integer array field → KILLED  
9. Decrementd (--a) integer local variable number 6 → KILLED  
10. Decrementd (--a) integer array field → KILLED

1. changed conditional boundary → SURVIVED  
2. negated conditional → KILLED  
3. removed conditional - replaced comparison check with false → KILLED  
4. removed conditional - replaced comparison check with true → SURVIVED  
5. Negated integer local variable number 7 → SURVIVED  
6. Negated integer local variable number 5 → KILLED  
7. greater or equal to less than → KILLED  
8. greater or equal to less or equal → KILLED  
9. greater or equal to greater than → SURVIVED  
10. greater or equal to equal → SURVIVED  
11. greater or equal to not equal → KILLED  
12. Incremented (a++) integer local variable number 7 → KILLED  
13. Incremented (a++) integer local variable number 5 → SURVIVED  
14. Decrementd (a--) integer local variable number 7 → KILLED  
15. Decrementd (a--) integer local variable number 5 → KILLED  
16. Incremented (++a) integer local variable number 7 → KILLED  
17. Incremented (++a) integer local variable number 5 → SURVIVED  
18. Decrementd (--a) integer local variable number 7 → KILLED  
19. Decrementd (--a) integer local variable number 5 → KILLED

1. removed call to org/jfree/data/Values2D::getValue → KILLED  
2. Negated integer local variable number 7 → KILLED  
3. Negated integer local variable number 1 → SURVIVED  
4. Incremented (a++) integer local variable number 7 → SURVIVED  
5. Incremented (a++) integer local variable number 1 → KILLED  
6. Decrementd (a--) integer local variable number 7 → SURVIVED  
7. Decrementd (a--) integer local variable number 1 → KILLED  
8. Incremented (++a) integer local variable number 7 → KILLED  
9. Incremented (++a) integer local variable number 1 → KILLED  
10. Decrementd (--a) integer local variable number 7 → KILLED  
11. Decrementd (--a) integer local variable number 1 → KILLED

1. negated conditional → KILLED  
2. removed conditional - replaced equality check with false → KILLED  
3. removed conditional - replaced equality check with true → SURVIVED  
4. equal to not equal → KILLED

15  
4

15  
5

15  
6

15  
7

15  
8

1. Replaced double addition with subtraction → KILLED
2. removed call to java/lang/Number::doubleValue → KILLED
3. Negated double local variable number 3 → KILLED
4. Replaced double operation with first member → KILLED
5. Replaced double operation by second member → KILLED
6. Replaced double addition with subtraction → KILLED
7. Replaced double addition with multiplication → KILLED
8. Replaced double addition with division → KILLED
9. Replaced double addition with modulus → KILLED
10. Incremented (a++) double local variable number 3 → SURVIVED
11. Decrementd (a--) double local variable number 3 → SURVIVED
12. Incremented (++a) double local variable number 3 → KILLED
13. Decrementd (--a) double local variable number 3 → KILLED

16  
2

1. replaced double return with 0.0d for  
org/jfree/data/DataUtilities::calculateColumnTotal → KILLED
2. replaced return of double value with -(x + 1) for  
org/jfree/data/DataUtilities::calculateColumnTotal → KILLED
3. Negated double local variable number 3 → KILLED
4. Incremented (a++) double local variable number 3 → SURVIVED
5. Decrementd (a--) double local variable number 3 → SURVIVED
6. Incremented (++a) double local variable number 3 → KILLED
7. Decrementd (--a) double local variable number 3 → KILLED

17  
5

1. removed call to org/jfree/chart/util/ParamChecks::nullNotPermitted → KILLED

17  
6

1. Substituted 0.0 with 1.0 → KILLED
2. Substituted 0.0 with 1.0 → KILLED
3. Substituted 0.0 with -1.0 → KILLED
4. Substituted 0.0 with 1.0 → KILLED
5. Substituted 0.0 with -1.0 → KILLED

17  
7

1. removed call to org/jfree/data/Values2D::getColumnCount → KILLED

17  
8

1. changed conditional boundary → KILLED
2. Changed increment from 1 to -1 → KILLED
3. Substituted 0 with 1 → KILLED
4. negated conditional → KILLED
5. removed conditional - replaced comparison check with false → KILLED
6. removed conditional - replaced comparison check with true → KILLED
7. Negated integer local variable number 5 → KILLED
8. Negated integer local variable number 4 → KILLED
9. Substituted 0 with 1 → KILLED
10. Substituted 0 with -1 → KILLED
11. Substituted 0 with 1 → KILLED
12. Substituted 0 with -1 → KILLED
13. Less than to less or equal → KILLED
14. Less than to greater than → KILLED



15. Less than to greater or equal → KILLED

16. Less than to equal → KILLED

17. Less than to not equal → SURVIVED

18. Incremented (a++) integer local variable number 5 → KILLED

19. Incremented (a++) integer local variable number 4 → KILLED

20. Decrementd (a--) integer local variable number 5 → KILLED

21. Decrementd (a--) integer local variable number 4 → KILLED

22. Incremented (++a) integer local variable number 5 → KILLED

23. Incremented (++a) integer local variable number 4 → KILLED

24. Decrementd (--a) integer local variable number 5 → KILLED

25. Decrementd (--a) integer local variable number 4 → KILLED

1. removed call to org/jfree/data/Values2D::getValue → KILLED

2. Negated integer local variable number 1 → SURVIVED

3. Negated integer local variable number 5 → KILLED

4. Incremented (a++) integer local variable number 1 → KILLED

5. Incremented (a++) integer local variable number 5 → KILLED

6. Decrementd (a--) integer local variable number 1 → KILLED

7. Decrementd (a--) integer local variable number 5 → KILLED

8. Incremented (++a) integer local variable number 1 → KILLED

9. Incremented (++a) integer local variable number 5 → KILLED

10. Decrementd (--a) integer local variable number 1 → KILLED

11. Decrementd (--a) integer local variable number 5 → KILLED

1. negated conditional → KILLED

2. removed conditional - replaced equality check with false → KILLED

3. removed conditional - replaced equality check with true → SURVIVED

4. equal to not equal → KILLED

1. Replaced double addition with subtraction → KILLED

2. removed call to java/lang/Number::doubleValue → KILLED

3. Negated double local variable number 2 → KILLED

4. Replaced double operation with first member → KILLED

5. Replaced double operation by second member → KILLED

6. Replaced double addition with subtraction → KILLED

7. Replaced double addition with multiplication → KILLED

8. Replaced double addition with division → KILLED

9. Replaced double addition with modulus → KILLED

10. Incremented (a++) double local variable number 2 → SURVIVED

11. Decrementd (a--) double local variable number 2 → SURVIVED

12. Incremented (++a) double local variable number 2 → KILLED

13. Decrementd (--a) double local variable number 2 → KILLED

1. replaced double return with 0.0d for

org/jfree/data/DataUtilities::calculateRowTotal → KILLED

2. replaced return of double value with -(x + 1) for

org/jfree/data/DataUtilities::calculateRowTotal → KILLED

3. Negated double local variable number 2 → KILLED

4. Incremented (a++) double local variable number 2 → SURVIVED

5. Decrementd (a--) double local variable number 2 → SURVIVED

17  
9

18  
0

18  
1

18  
4

6. Incremented (++a) double local variable number 2 → KILLED  
7. Decrementd (--a) double local variable number 2 → KILLED

20  
1

1. removed call to org/jfree/chart/util/ParamChecks::nullNotPermitted → SURVIVED

20  
2

1. Substituted 0.0 with 1.0 → KILLED  
2. Substituted 0.0 with 1.0 → KILLED  
3. Substituted 0.0 with -1.0 → KILLED  
4. Substituted 0.0 with 1.0 → KILLED  
5. Substituted 0.0 with -1.0 → KILLED

20  
3

1. removed call to org/jfree/data/Values2D::getColumnCount → KILLED

20  
4

1. changed conditional boundary → KILLED  
2. Changed increment from 1 to -1 → KILLED  
3. Substituted 0 with 1 → KILLED  
4. negated conditional → KILLED  
5. removed conditional - replaced comparison check with false → KILLED  
6. removed conditional - replaced comparison check with true → KILLED  
7. Negated integer local variable number 6 → KILLED  
8. Substituted 0 with 1 → KILLED  
9. Substituted 0 with -1 → KILLED  
10. Substituted 0 with 1 → KILLED  
11. Substituted 0 with -1 → KILLED  
12. Less than to less or equal → KILLED  
13. Less than to greater than → KILLED  
14. Less than to greater or equal → KILLED  
15. Less than to equal → KILLED  
16. Less than to not equal → SURVIVED  
17. Incremented (a++) integer local variable number 6 → KILLED  
18. Decrementd (a--) integer local variable number 6 → KILLED  
19. Incremented (++a) integer local variable number 6 → KILLED  
20. Decrementd (--a) integer local variable number 6 → KILLED

20  
5

1. Negated integer local variable number 6 → KILLED  
2. Negated integer array field → KILLED  
3. Incremented (a++) integer local variable number 6 → KILLED  
4. Incremented (a++) integer array field → SURVIVED  
5. Decrementd (a--) integer local variable number 6 → TIMED\_OUT  
6. Decrementd (a--) integer array field → SURVIVED  
7. Incremented (++a) integer local variable number 6 → KILLED  
8. Incremented (++a) integer array field → KILLED  
9. Decrementd (--a) integer local variable number 6 → KILLED  
10. Decrementd (--a) integer array field → KILLED

20  
6

1. changed conditional boundary → SURVIVED  
2. negated conditional → KILLED  
3. removed conditional - replaced comparison check with false → KILLED



4. removed conditional - replaced comparison check with true → SURVIVED  
 5. Negated integer local variable number 7 → SURVIVED  
 6. Negated integer local variable number 5 → KILLED  
 7. greater or equal to less than → KILLED  
 8. greater or equal to less or equal → KILLED  
 9. greater or equal to greater than → SURVIVED  
 10. greater or equal to equal → SURVIVED  
 11. greater or equal to not equal → KILLED  
 12. Incremented (a++) integer local variable number 7 → KILLED  
 13. Incremented (a++) integer local variable number 5 → SURVIVED  
 14. Decrementd (a--) integer local variable number 7 → KILLED  
 15. Decrementd (a--) integer local variable number 5 → KILLED  
 16. Incremented (++a) integer local variable number 7 → KILLED  
 17. Incremented (++a) integer local variable number 5 → SURVIVED  
 18. Decrementd (--a) integer local variable number 7 → KILLED  
 19. Decrementd (--a) integer local variable number 5 → KILLED

1. removed call to org/jfree/data/Values2D::getValue → KILLED  
 2. Negated integer local variable number 1 → SURVIVED  
 3. Negated integer local variable number 7 → KILLED  
 4. Incremented (a++) integer local variable number 1 → KILLED  
 5. Incremented (a++) integer local variable number 7 → SURVIVED  
 6. Decrementd (a--) integer local variable number 1 → KILLED  
 7. Decrementd (a--) integer local variable number 7 → SURVIVED  
 8. Incremented (++a) integer local variable number 1 → KILLED  
 9. Incremented (++a) integer local variable number 7 → KILLED  
 10. Decrementd (--a) integer local variable number 1 → KILLED  
 11. Decrementd (--a) integer local variable number 7 → KILLED

1. negated conditional → KILLED  
 2. removed conditional - replaced equality check with false → KILLED  
 3. removed conditional - replaced equality check with true → SURVIVED  
 4. equal to not equal → KILLED

1. Replaced double addition with subtraction → KILLED  
 2. removed call to java/lang/Number::doubleValue → KILLED  
 3. Negated double local variable number 3 → KILLED  
 4. Replaced double operation with first member → KILLED  
 5. Replaced double operation by second member → KILLED  
 6. Replaced double addition with subtraction → KILLED  
 7. Replaced double addition with multiplication → KILLED  
 8. Replaced double addition with division → KILLED  
 9. Replaced double addition with modulus → KILLED  
 10. Incremented (a++) double local variable number 3 → SURVIVED  
 11. Decrementd (a--) double local variable number 3 → SURVIVED  
 12. Incremented (++a) double local variable number 3 → KILLED  
 13. Decrementd (--a) double local variable number 3 → KILLED

1. replaced double return with 0.0d for  
 org/jfree/data/DataUtilities::calculateRowTotal → KILLED

20  
7

20  
8

20  
9

21  
3

2. replaced return of double value with  $-(x + 1)$  for  
org/jfree/data/DataUtilities::calculateRowTotal → KILLED  
3. Negated double local variable number 3 → KILLED

4. Incremented (a++) double local variable number 3 → SURVIVED

5. Decrementd (a--) double local variable number 3 → SURVIVED

6. Incremented (++a) double local variable number 3 → KILLED

7. Decrementd (--a) double local variable number 3 → KILLED

22  
5

1. removed call to org/jfree/chart/util/ParamChecks::nullNotPermitted → SURVIVED

1. changed conditional boundary → KILLED

2. Substituted 0 with 1 → KILLED

3. negated conditional → KILLED

4. removed conditional - replaced comparison check with false → KILLED

5. removed conditional - replaced comparison check with true → KILLED

6. Negated integer local variable number 2 → KILLED

7. Substituted 0 with 1 → KILLED

8. Substituted 0 with -1 → KILLED

9. Substituted 0 with 1 → KILLED

10. Substituted 0 with -1 → KILLED

11. Less than to less or equal → KILLED

12. Less than to greater than → KILLED

13. Less than to greater or equal → KILLED

14. Less than to equal → KILLED

15. Less than to not equal → SURVIVED

16. Incremented (a++) integer local variable number 2 → KILLED

17. Decrementd (a--) integer local variable number 2 → KILLED

18. Incremented (++a) integer local variable number 2 → KILLED

19. Decrementd (--a) integer local variable number 2 → KILLED

22  
7

1. removed call to java/lang/Double::<init> → KILLED

2. Negated integer local variable number 2 → KILLED

3. Negated integer local variable number 2 → KILLED

4. Negated double array field → KILLED

5. Incremented (a++) integer local variable number 2 → KILLED

6. Incremented (a++) integer local variable number 2 → KILLED

7. Incremented (a++) double array field → SURVIVED

8. Decrementd (a--) integer local variable number 2 → KILLED

9. Decrementd (a--) integer local variable number 2 → TIMED\_OUT

10. Decrementd (a--) double array field → SURVIVED

11. Incremented (++a) integer local variable number 2 → KILLED

12. Incremented (++a) integer local variable number 2 → KILLED

13. Incremented (++a) double array field → KILLED

14. Decrementd (--a) integer local variable number 2 → KILLED

15. Decrementd (--a) integer local variable number 2 → KILLED

16. Decrementd (--a) double array field → KILLED

22  
8

23  
0

1. replaced return value with null for  
org/jfree/data/DataUtilities::createNumberArray → KILLED

2. mutated return of Object value for  
org/jfree/data/DataUtilities::createNumberArray to ( if (x != null) null else  
throw new RuntimeException ) → KILLED

24  
2

1. removed call to org/jfree/chart/util/ParamChecks::nullNotPermitted →  
SURVIVED

24  
4

1. Negated integer local variable number 1 → KILLED  
2. Incremented (a++) integer local variable number 1 → KILLED  
3. Decrementd (a--) integer local variable number 1 → KILLED  
4. Incremented (++a) integer local variable number 1 → KILLED  
5. Decrementd (--a) integer local variable number 1 → KILLED

24  
5

1. changed conditional boundary → KILLED  
2. Changed increment from 1 to -1 → KILLED  
3. Substituted 0 with 1 → KILLED  
4. negated conditional → KILLED  
5. removed conditional - replaced comparison check with false → KILLED  
6. removed conditional - replaced comparison check with true → KILLED  
7. Negated integer local variable number 3 → KILLED  
8. Negated integer local variable number 1 → KILLED  
9. Substituted 0 with 1 → KILLED  
10. Substituted 0 with -1 → KILLED  
11. Substituted 0 with 1 → KILLED  
12. Substituted 0 with -1 → KILLED  
13. Less than to less or equal → KILLED  
14. Less than to greater than → KILLED  
15. Less than to greater or equal → KILLED  
16. Less than to equal → KILLED

17. Less than to not equal → SURVIVED

18. Incremented (a++) integer local variable number 3 → KILLED  
19. Incremented (a++) integer local variable number 1 → KILLED  
20. Decrementd (a--) integer local variable number 3 → KILLED  
21. Decrementd (a--) integer local variable number 1 → KILLED  
22. Incremented (++a) integer local variable number 3 → KILLED  
23. Incremented (++a) integer local variable number 1 → KILLED  
24. Decrementd (--a) integer local variable number 3 → KILLED  
25. Decrementd (--a) integer local variable number 1 → KILLED

24  
6

1. removed call to org/jfree/data/DataUtilities::createNumberArray →  
KILLED  
2. Negated integer local variable number 3 → KILLED  
3. Negated integer local variable number 3 → KILLED  
4. Incremented (a++) integer local variable number 3 → KILLED  
5. Incremented (a++) integer local variable number 3 → KILLED  
6. Decrementd (a--) integer local variable number 3 → KILLED  
7. Decrementd (a--) integer local variable number 3 → TIMED\_OUT  
8. Incremented (++a) integer local variable number 3 → KILLED  
9. Incremented (++a) integer local variable number 3 → KILLED  
10. Decrementd (--a) integer local variable number 3 → KILLED

11. Decrementd (--a) integer local variable number 3 → KILLED

24  
8

1. replaced return value with null for  
org/jfree/data/DataUtilities::createNumberArray2D → KILLED  
2. mutated return of Object value for  
org/jfree/data/DataUtilities::createNumberArray2D to ( if (x != null) null  
else throw new RuntimeException ) → KILLED

26  
2

1. removed call to org/jfree/chart/util/ParamChecks::nullNotPermitted →  
NO\_COVERAGE

26  
3

1. removed call to org/jfree/data/DefaultKeyedValues::<init> →  
NO\_COVERAGE

26  
4

1. Substituted 0.0 with 1.0 → NO\_COVERAGE  
2. Substituted 0.0 with 1.0 → NO\_COVERAGE  
3. Substituted 0.0 with -1.0 → NO\_COVERAGE  
4. Substituted 0.0 with 1.0 → NO\_COVERAGE  
5. Substituted 0.0 with -1.0 → NO\_COVERAGE

26  
5

1. changed conditional boundary → NO\_COVERAGE  
2. Substituted 0 with 1 → NO\_COVERAGE  
3. negated conditional → NO\_COVERAGE  
4. removed call to org/jfree/data/KeyedValues::getItemCount →  
NO\_COVERAGE  
5. removed conditional - replaced comparison check with false →  
NO\_COVERAGE  
6. removed conditional - replaced comparison check with true →  
NO\_COVERAGE  
7. Negated integer local variable number 4 → NO\_COVERAGE  
8. Substituted 0 with 1 → NO\_COVERAGE  
9. Substituted 0 with -1 → NO\_COVERAGE  
10. Substituted 0 with 1 → NO\_COVERAGE  
11. Substituted 0 with -1 → NO\_COVERAGE  
12. Less than to less or equal → NO\_COVERAGE  
13. Less than to greater than → NO\_COVERAGE  
14. Less than to greater or equal → NO\_COVERAGE  
15. Less than to equal → NO\_COVERAGE  
16. Less than to not equal → NO\_COVERAGE  
17. Incremented (a++) integer local variable number 4 → NO\_COVERAGE  
18. Decrementd (a--) integer local variable number 4 → NO\_COVERAGE  
19. Incremented (++a) integer local variable number 4 → NO\_COVERAGE  
20. Decrementd (--a) integer local variable number 4 → NO\_COVERAGE

26  
6

1. removed call to org/jfree/data/KeyedValues::getValue → NO\_COVERAGE  
2. Negated integer local variable number 4 → NO\_COVERAGE  
3. Incremented (a++) integer local variable number 4 → NO\_COVERAGE  
4. Decrementd (a--) integer local variable number 4 → NO\_COVERAGE  
5. Incremented (++a) integer local variable number 4 → NO\_COVERAGE  
6. Decrementd (--a) integer local variable number 4 → NO\_COVERAGE

26  
7

1. negated conditional → NO\_COVERAGE
2. removed conditional - replaced equality check with false → NO\_COVERAGE
3. removed conditional - replaced equality check with true → NO\_COVERAGE
4. equal to not equal → NO\_COVERAGE

26  
8

1. Replaced double addition with subtraction → NO\_COVERAGE
2. removed call to java/lang/Number::doubleValue → NO\_COVERAGE
3. Negated double local variable number 2 → NO\_COVERAGE
4. Replaced double operation with first member → NO\_COVERAGE
5. Replaced double operation by second member → NO\_COVERAGE
6. Replaced double addition with subtraction → NO\_COVERAGE
7. Replaced double addition with multiplication → NO\_COVERAGE
8. Replaced double addition with division → NO\_COVERAGE
9. Replaced double addition with modulus → NO\_COVERAGE
10. Incremented (a++) double local variable number 2 → NO\_COVERAGE
11. Decrementd (a--) double local variable number 2 → NO\_COVERAGE
12. Incremented (++a) double local variable number 2 → NO\_COVERAGE
13. Decrementd (--a) double local variable number 2 → NO\_COVERAGE

27  
1

1. Substituted 0.0 with 1.0 → NO\_COVERAGE
2. Substituted 0.0 with 1.0 → NO\_COVERAGE
3. Substituted 0.0 with -1.0 → NO\_COVERAGE
4. Substituted 0.0 with 1.0 → NO\_COVERAGE
5. Substituted 0.0 with -1.0 → NO\_COVERAGE

27  
2

1. changed conditional boundary → NO\_COVERAGE
2. Substituted 0 with 1 → NO\_COVERAGE
3. negated conditional → NO\_COVERAGE
4. removed call to org/jfree/data/KeyedValues::getItemCount → NO\_COVERAGE
5. removed conditional - replaced comparison check with false → NO\_COVERAGE
6. removed conditional - replaced comparison check with true → NO\_COVERAGE
7. Negated integer local variable number 6 → NO\_COVERAGE
8. Substituted 0 with 1 → NO\_COVERAGE
9. Substituted 0 with -1 → NO\_COVERAGE
10. Substituted 0 with 1 → NO\_COVERAGE
11. Substituted 0 with -1 → NO\_COVERAGE
12. Less than to less or equal → NO\_COVERAGE
13. Less than to greater than → NO\_COVERAGE
14. Less than to greater or equal → NO\_COVERAGE
15. Less than to equal → NO\_COVERAGE
16. Less than to not equal → NO\_COVERAGE
17. Incremented (a++) integer local variable number 6 → NO\_COVERAGE
18. Decrementd (a--) integer local variable number 6 → NO\_COVERAGE
19. Incremented (++a) integer local variable number 6 → NO\_COVERAGE

20. Decrementd (--a) integer local variable number 6 → NO\_COVERAGE

1. removed call to org/jfree/data/KeyedValues::getValue → NO\_COVERAGE
2. Negated integer local variable number 6 → NO\_COVERAGE
3. Incremented (a++) integer local variable number 6 → NO\_COVERAGE
4. Decrementd (a--) integer local variable number 6 → NO\_COVERAGE
5. Incremented (++a) integer local variable number 6 → NO\_COVERAGE
6. Decrementd (--a) integer local variable number 6 → NO\_COVERAGE

1. negated conditional → NO\_COVERAGE
2. removed conditional - replaced equality check with false → NO\_COVERAGE
3. removed conditional - replaced equality check with true → NO\_COVERAGE
4. equal to not equal → NO\_COVERAGE

1. Replaced double addition with subtraction → NO\_COVERAGE
2. removed call to java/lang/Number::doubleValue → NO\_COVERAGE
3. Negated double local variable number 4 → NO\_COVERAGE
4. Replaced double operation with first member → NO\_COVERAGE
5. Replaced double operation by second member → NO\_COVERAGE
6. Replaced double addition with subtraction → NO\_COVERAGE
7. Replaced double addition with multiplication → NO\_COVERAGE
8. Replaced double addition with division → NO\_COVERAGE
9. Replaced double addition with modulus → NO\_COVERAGE
10. Incremented (a++) double local variable number 4 → NO\_COVERAGE
11. Decrementd (a--) double local variable number 4 → NO\_COVERAGE
12. Incremented (++a) double local variable number 4 → NO\_COVERAGE
13. Decrementd (--a) double local variable number 4 → NO\_COVERAGE

1. removed call to java/lang/Double::<init> → NO\_COVERAGE
2. Replaced double division with multiplication → NO\_COVERAGE
3. removed call to org/jfree/data/KeyedValues::getKey → NO\_COVERAGE
4. removed call to org/jfree/data/DefaultKeyedValues::addValue → NO\_COVERAGE
5. Negated integer local variable number 6 → NO\_COVERAGE
6. Negated double local variable number 4 → NO\_COVERAGE
7. Negated double local variable number 2 → NO\_COVERAGE
8. Replaced double operation with first member → NO\_COVERAGE
9. Replaced double operation by second member → NO\_COVERAGE
10. Replaced double division with multiplication → NO\_COVERAGE
11. Replaced double division with modulus → NO\_COVERAGE
12. Replaced double division with addition → NO\_COVERAGE
13. Replaced double division with subtraction → NO\_COVERAGE
14. Incremented (a++) integer local variable number 6 → NO\_COVERAGE
15. Incremented (a++) double local variable number 4 → NO\_COVERAGE
16. Incremented (a++) double local variable number 2 → NO\_COVERAGE
17. Decrementd (a--) integer local variable number 6 → NO\_COVERAGE
18. Decrementd (a--) double local variable number 4 → NO\_COVERAGE
19. Decrementd (a--) double local variable number 2 → NO\_COVERAGE



20. Incremented (++a) integer local variable number 6 → NO\_COVERAGE  
21. Incremented (++a) double local variable number 4 → NO\_COVERAGE  
22. Incremented (++a) double local variable number 2 → NO\_COVERAGE  
23. Decrementd (--a) integer local variable number 6 → NO\_COVERAGE  
24. Decrementd (--a) double local variable number 4 → NO\_COVERAGE  
25. Decrementd (--a) double local variable number 2 → NO\_COVERAGE

1. replaced return value with null for  
org/jfree/data/DataUtilities::getCumulativePercentages → NO\_COVERAGE  
2. mutated return of Object value for  
org/jfree/data/DataUtilities::getCumulativePercentages to ( if (x != null)  
null else throw new RuntimeException ) → NO\_COVERAGE

## Active mutators

- ABS\_MUTATOR
- AOD\_1\_MUTATOR
- AOD\_2\_MUTATOR
- AOR\_1\_MUTATOR
- AOR\_2\_MUTATOR
- AOR\_3\_MUTATOR
- AOR\_4\_MUTATOR
- ARGUMENT\_PROPAGATION\_MUTATOR
- BOOLEAN\_FALSE\_RETURN
- BOOLEAN\_TRUE\_RETURN
- CONDITIONALS\_BOUNDARY\_MUTATOR
- CONSTRUCTOR\_CALL\_MUTATOR
- CRCR\_1\_MUTATOR
- CRCR\_2\_MUTATOR
- CRCR\_3\_MUTATOR
- CRCR\_4\_MUTATOR
- CRCR\_5\_MUTATOR
- CRCR\_6\_MUTATOR
- EMPTY\_RETURN\_VALUES
- EXPERIMENTAL\_BIGINTEGER\_MUTATOR
- EXPERIMENTAL\_MEMBER\_VARIABLE\_MUTATOR
- EXPERIMENTAL\_REMOVE\_SWITCH\_MUTATOR\_[0-99]
- EXPERIMENTAL\_SWITCH\_MUTATOR
- INCREMENTS\_MUTATOR
- INLINE\_CONSTANT\_MUTATOR
- INVERT\_NEGS\_MUTATOR
- MATH\_MUTATOR
- NAKED\_RECEIVER
- NEGATE\_CONDITIONALS\_MUTATOR
- NON\_VOID\_METHOD\_CALL\_MUTATOR
- NULL\_RETURN\_VALUES
- OBBN\_1\_MUTATOR
- OBBN\_2\_MUTATOR
- OBBN\_3\_MUTATOR

- PRIMITIVE\_RETURN\_VALS\_MUTATOR
- REMOVE\_CONDITIONALS\_EQUAL\_ELSE\_MUTATOR
- REMOVE\_CONDITIONALS\_EQUAL\_IF\_MUTATOR
- REMOVE\_CONDITIONALS\_ORDER\_ELSE\_MUTATOR
- REMOVE\_CONDITIONALS\_ORDER\_IF\_MUTATOR
- REMOVE\_INCREMENTS\_MUTATOR
- RETURN\_VALS\_MUTATOR
- ROR\_1\_MUTATOR
- ROR\_2\_MUTATOR
- ROR\_3\_MUTATOR
- ROR\_4\_MUTATOR
- ROR\_5\_MUTATOR
- UOI\_1\_MUTATOR
- UOI\_2\_MUTATOR
- UOI\_3\_MUTATOR
- UOI\_4\_MUTATOR
- VOID\_METHOD\_CALL\_MUTATOR

## Tests examined

- org.jfree.data.DataUtilitiesTest.calculateRowTotalPos(org.jfree.data.DataUtilitiesTest) (6 ms)
- org.jfree.data.DataUtilitiesTest.test1NULLand1EmptyArrayEquality(org.jfree.data.DataUtilitiesTest) (3 ms)
- org.jfree.data.DataUtilitiesTest.test1NULLand1NormalArrayEquality(org.jfree.data.DataUtilitiesTest) (3 ms)
- org.jfree.data.DataUtilitiesTest.calculateRowTotalOneColumn(org.jfree.data.DataUtilitiesTest) (4 ms)
- org.jfree.data.DataUtilitiesTest.calculateRowTotalNeg(org.jfree.data.DataUtilitiesTest) (6 ms)
- org.jfree.data.DataUtilitiesTest.testUnequalArraysEquality(org.jfree.data.DataUtilitiesTest) (2 ms)
- org.jfree.data.DataUtilitiesTest.calculateRowTotalZero(org.jfree.data.DataUtilitiesTest) (4 ms)
- org.jfree.data.DataUtilitiesTest.testAValidInputUsingMiddleColumnsForMethodCalculateColumnTotal(org.jfree.data.DataUtilitiesTest) (4 ms)
- org.jfree.data.DataUtilitiesTest.testAValidInputUsingEdgeColumnsForMethodCalculateRowTotal(org.jfree.data.DataUtilitiesTest) (4 ms)
- org.jfree.data.DataUtilitiesTest.test2NULLArraysEquality(org.jfree.data.DataUtilitiesTest) (1 ms)
- org.jfree.data.DataUtilitiesTest.calculateColumnTotalForThreeRowswithPosNegValues(org.jfree.data.DataUtilitiesTest) (7 ms)
- org.jfree.data.DataUtilitiesTest.testUnequalDimensionsArraysEquality(org.jfree.data.DataUtilitiesTest) (3 ms)
- org.jfree.data.DataUtilitiesTest.testAValidInputUsingEdgeRowsForMethodCalculateColumnTotal(org.jfree.data.DataUtilitiesTest) (6 ms)
- org.jfree.data.DataUtilitiesTest.test2INFArraysEquality(org.jfree.data.DataUtilitiesTest) (2 ms)



- org.jfree.data.DataUtilitiesTest.testClone(org.jfree.data.DataUtilitiesTest) (2 ms)
- org.jfree.data.DataUtilitiesTest.calculateColumnTotalForFiveRows(org.jfree.data.DataUtilitiesTest) (114 ms)
- org.jfree.data.DataUtilitiesTest.testCreateNumberArray(org.jfree.data.DataUtilitiesTest) (2 ms)
- org.jfree.data.DataUtilitiesTest.test1NANand1INFArrayEquality(org.jfree.data.DataUtilitiesTest) (2 ms)
- org.jfree.data.DataUtilitiesTest.testEmptyArraysEquality(org.jfree.data.DataUtilitiesTest) (2 ms)
- org.jfree.data.DataUtilitiesTest.calculateColumnTotalForTwoRowswithNegValues(org.jfree.data.DataUtilitiesTest) (11 ms)
- org.jfree.data.DataUtilitiesTest.testCreateNumberArray2D(org.jfree.data.DataUtilitiesTest) (2 ms)
- org.jfree.data.DataUtilitiesTest.testAValidInputUsingMiddleColumnsForMethodCalculateRowTotal(org.jfree.data.DataUtilitiesTest) (4 ms)
- org.jfree.data.DataUtilitiesTest.testEqualArraysEquality(org.jfree.data.DataUtilitiesTest) (2 ms)
- org.jfree.data.DataUtilitiesTest.calculateRowTotalIllegalArgumentException(org.jfree.data.DataUtilitiesTest) (9 ms)
- org.jfree.data.DataUtilitiesTest.test2NANArraysEquality(org.jfree.data.DataUtilitiesTest) (2 ms)

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